

1.0 INTRODUCTION

Tetra Tech EM Inc. (Tetra Tech), under Contract No. 006244 with the Utah Department of Environmental Quality (UDEQ) Division of Solid and Hazardous Waste (DSHW), was issued Work Order 001 to evaluate the health risk of air emissions from the treatment of munitions at Tooele Chemical Agent Disposal Facility (TOCDF) and Chemical Agent Munitions Disposal System (CAMDS) (Tetra Tech 2000a; DSHW 2000b). TOCDF and CAMDS are located at the Deseret Chemical Depot (DCD) in Tooele County, Utah. The stockpiled munitions include organophosphate nerve agents and sulfur mustard blister agents. The nerve agents include isopropyl methylphosphonofluoridate (GB) and O-ethyl-S-[2-diisopropylaminoethyl] methylphosphonothiolate (VX). Sulfur mustard includes three chemical agents: (1) bis(2-chloroethyl) sulfide (H), (2) HD (distilled H), and (3) HT (a mixture of HD and bis-2-(chloroethylthioethyl)ether (T)).

Under Task 03 of the work order, Tetra Tech was authorized to prepare a protocol (“the protocol”) describing the technical procedures that will be used to evaluate the health risk from munitions treatment. The protocol describes the technical methodology, assumptions, and parameter values for the risk assessment. This final protocol, which has been updated from the draft protocol submitted to DSHW in October 2000, builds on earlier risk assessment work conducted by DSHW at DCD. The protocol also includes emission rates for compounds of potential concern (COPC) and a description of the procedures used to estimate emission rates. The final protocol incorporates comments on the draft protocol by DSHW, the Army, and other organizations.

The objectives of the protocol are to describe detailed technical procedures, assumptions, and parameter values that will be used to assess risk to human health from the incineration of munitions stockpiled at DCD. The protocol is divided into 11 sections, seven appendices, and one attachment, as follows:

- Section 2—Facility characterization, including identification of COPCs and their emission rates
- Section 3—Summary of air dispersion and deposition modeling
- Section 4—Exposure assessment
- Section 5—Exposure quantification

- Section 6–Toxicity assessment
- Section 7–Risk characterization
- Sections 8 through 11–Presentation of results, uncertainties, conclusions, and references
- Appendices A through C–TOCDF and CAMDS emission rates
- Appendix D–COPC chemical and physical properties.
- Appendix E–Equations and parameter values for calculating COPC media concentrations
- Appendix F–Equations and parameter values for characterizing risk
- Appendix G–Comments on the draft protocol and DSHW responses
- Attachment–Complete air dispersion and deposition modeling report

Incremental risk for each agent campaign (GB, VX, sulfur mustard) will be determined. The HHRA will be based on both actual and extrapolated emission rates, depending on the agent and source. For sources evaluated with extrapolated emission rates, DSHW will update the HHRA when trial burn data are collected.

The HHRA is a tool for DSHW to evaluate the protectiveness of the operating conditions of the RCRA permit for DCD. The DSHW has the authority and responsibility to establish permit conditions as necessary to protect human health and the environment (Utah Administrative Code [UAC] R315-3-23; Title 40 Code of Federal Regulations [CFR] 270.32(b)(2)).

The protocol was prepared in accordance with the peer review draft of the U.S. Environmental Protection Agency’s (U.S. EPA) *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (U.S. EPA 1998a), and the subsequent errata issued on August 2, 1999 (U.S. EPA 1999). U.S. EPA (1998a) was prepared as national guidance to consolidate information presented in other risk assessment guidance and methodology documents previously prepared by U.S. EPA and state regulatory agencies. U.S. EPA (1998a) is currently undergoing peer review. The latest approved guidance for assessing health risk from RCRA hazardous waste combustors is *Revised Draft Guidance for Performing Screening Level Risk Analyses at Combustion Facilities Burning Hazardous Wastes* (U.S. EPA 1994).

However, the U.S. EPA no longer supports the COMPDEP air dispersion model recommended in the 1994 guidance. The U.S. EPA Office of Solid Waste recommends the use of U.S. EPA (1998a) for conducting human health risk assessments on emissions from Resource Conservation and Recovery Act (RCRA) hazardous waste combustion units. Risk characterization will be performed with the INDUSTRIAL RISK ASSESSMENT-*h* VIEW[®] (IRAP-*h* VIEW[®]) software that performs risk computations in accordance with U.S. EPA (1998a) guidance.